LIE-DOWN MASSAGER

By

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BACKGROUND OF THE INVENTION

The invention relates generally to a massaging device. More particularly, the present invention relates to an improved lie-down massager capable of efficiently treating bodily malfunctions such as back pain and gastrointestinal weakness by applying a therapeutic massaging treatment along the back and neck of a patient lying down on the massager whose massaging bumps move horizontally and vertically along the patient's spinal cord and neck while the vertical movement of the massaging bumps are compensated and smoothed by air shock actuators.

Conventional bed or mat type massaging devices employ a spring mechanism for vertically moving massaging bumps. As disclosed USP 6,454,732, a spring mechanism allows the massaging bumps to gently move up and down. However, when it comes to therapeutic effects, the spring mechanism proves too soft to push up the massaging bumps when stronger pressure is required, because tension of springs applies equally to patients lying on the massaging device regardless of patient's requirements.

A demand is to adopt a reliable mechanism demonstrating a steady and robust therapeutic effects while stabilizing the vertical movement of the massaging bumps.

SUMMARY OF THE INVENTION

The present invention is contrived to overcome the conventional disadvantages. Accordingly, an object of the invention is to provide a lie-down massager that improves therapeutic effects by adopting air shock absorbers for compensating vertical movement of massaging bumps. Another object is to improve product reliability and customer satisfaction by mechanically stabilizing the vertical movement of the massaging bumps.

To achieve these and other objects, the lie-down massager according to the present invention includes a base frame having an elongated top panel, through which an elongated top opening is formed centrally and lengthwise, a rider provided below the elongated top panel of the base frame, a guide member movably engaged between the base frame and the rider so as to enable the rider to make a horizontally reciprocal movement relative to the base frame, a lifter, one or more air shock absorbers, massage bumps attached on the lifter via the air shock absorbers and moved by the lifter vertically

and/or horizontally along the elongated top opening of the elongated top panel of the base frame, and a pad covering the massage bumps and the elongated top opening of the base frame.

The lifter includes a top plate, a bottom plate, a vertical actuator that moves the top plate up and down.

A massage plate is provided. The massage bumps are installed on the massage plate, and the air shock absorbers are vertically installed between the massage plate and the top plate.

Each of the air shock absorbers has a hollow cylinder, a plunger that is moved reciprocally in the cylinder, a shaft fixed to the plunger and protruding out of the cylinder and a bracket. The free end of the shaft is shaped as a ball, and the bracket has a semi-spherical recess so that so that the end of the shaft and the recess of the bracket form a ball and socket joint. The cylinder is fixed to the top plate, and the bracket is fixed to the massage plate.

Preferably, the number of the air shock absorbers is four, and the air shock absorbers are positioned near the four corners of the rectangular top plate.

The massage bumps are partitioned to first and second pairs, and the first pair bumps are aligned parallel to the second pair bumps. The massage bump

includes a heater that is a heating lamp generating heat and infrared rays.

First and second bump holders are provided for propping and maintaining the first and second pair bumps above the top portion of the lifter. The first and second bump holders are tapered toward each lower end thereof. Also a first engagement member to rockingly engage the lower ends of the bump holders to the top portion of the lifter, and a second engagement member to rollingly engage the massage bumps thereto are provided. The massage bumps are roller balls that are formed of jade.

Alternatively, the massage bumps are provided as round projections that are fixed to the top upper surface portion of the lifter.

The guide member includes one or more roller gear engaged to and powered by a roller gear motor, and one or more side rack gears parallel to each other and provided lengthwise in the base frame. The roller gear motor is fixed to the rider, and the roller gears are rollably connected to the rider and rotatably mounted on the side rack gears.

Alternatively, the guide member includes rider guide rollers provided on each side of the rider, and a pair of pulleys linked by a rope and respectively mounted in a front end portion and a rear end portion of the base

frame. The rider guide rollers are rollably engaged to the base frame to guide a horizontally reciprocal movement of the rider. A predetermined portion of the rope is fixedly attached to the rider so that the pulley rotation enables the rider to generate a horizontally reciprocal movement of the rider. The pulleys are relatively twisted by 90 degrees against each other.

The lie-down massager further includes a pair of roller coasters parallel to each other, and coaster guide rollers formed outwardly extending from each side of the lifter. The roller coasters are attached to the base frame, and each of the roller coasters has a substantially waved top surface. The coaster guide rollers enable the coasting member to make a roller coasting movement on and along the waved top surfaces of the roller coasters. Each of the waved top surfaces of the roller coasters substantially forms a curvature of a human spinal cord.

The bottom plate of the lifter further includes a plurality of elongated guides extending downward, and the rider further has a plurality of guide bushes upwardly formed on the rider to releasably receive the elongated guides so as to stabilize the roller coasting movement of the lifter along the roller coasters. The elongated guides are shaped in pins.

Advantages of the present inventions include that: (1) the air shock absorbers provides massaging motions that are flexible and adapted to the body contour of the user; (2) the air shock absorber provides smooth and quite operation of the lifter; and (3) the coasting member working with the roller coasters to realize an additional lifting by utilizing the horizontally reciprocal movement of the rider enables the massaging bumps to continue a smooth, steady and robust massaging on the patient, thereby substantially improving massaging effect and subsequently maximizing customer satisfaction.

Although the present invention is briefly summarized, the full understanding of the invention can be obtained by the following drawings, detailed description and appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

These and other features, aspects and advantages of the present invention will become better understood with reference to the accompanying drawings, wherein:

FIG. 1 is a view showing a lie-down massager with a patient lying thereon according to the present invention;

FIG. 2 is a plan view showing the lie-down massager without the patient in FIG. 1;

FIG. 3 is a partial perspective view showing an overall mechanism of the lie-down massager according to a first embodiment of the present invention;

FIG. 4 is a partial plan view showing a second embodiment of the present invention;

FIG. 5 is a partial perspective view showing the mechanism according to the second embodiment of the present invention;

FIG. 6 is a partial exploded perspective view showing the rider, air shock absorbers and the lifter;

FIG. 7 is a perspective view of the lifter and the shock absorbers showing the operation of the lifter;

FIG. 8 is a front elevation view showing that the lifter is in its lowest position;

FIG. 9 is a front elevation view showing that the lifter is in its highest position;

FIG. 10 is a side elevation view of the lifter and the shock absorbers; and

FIG. 11 is a cross-sectional view of the air shock absorber.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

FIG. 1 shows a brief massaging mechanism of a lie-down massager **10** according to the present invention with a patient lying thereon for a bodily massage, and FIG. 2

shows a plan view of the massager **10** excluding the patient. As shown therein, the lie-down massager **10** includes a base frame **12** in a bed type or a mat type. The base frame **12** includes an elongated top panel **14**, and an elongated opening **16** is formed centrally and lengthwise through the elongated top panel **14**. The massager **10** includes a rider **18** and a lifter **20**. The rider **18** is provided below the elongated top panel **14** of the base frame **12**.

In order to implement the horizontal reciprocation of the rider **18**, there is provided a guide member **26** movably engaged between the base frame **12** and the rider **18** so as to enable the rider **18** to make a horizontally reciprocal movement relative to the base frame **12**. Here, it is recommended that the guide member **26** be either a rope-pulley application or a rack gear application.

Massage bumps **100** are attached on the lifter **20** via one or more air shock absorbers **300** and are moved by the lifter **20** vertically and/or horizontally along the elongated top opening **16** of the elongated top panel **14** of the base frame **12**.

As shown in FIG. 2 together with FIG. 3, the guide member **26** according to the rope-pulley application includes a rope **28**, a pair of pulleys **30** and a pulley motor **32** that controls one of the pulleys **30**. The pulleys

30 are linked by the rope 28 and respectively mounted in a front end portion 34 and a rear end portion 36 of the base frame 12. In a preferred version, the pulley motor 32 is provided adjacent to the pulley 30 provided in the rear end portion 36 of the base frame 12. In this construction, a predetermined portion 29 of the rope 28 is fixedly attached to the rider 18 so that the pulley rotation enables the rider 18 to generate a horizontally reciprocal movement of the rider 18. Preferably, the pulleys 30 are relatively twisted by 90 degrees against each other to facilitate the horizontal reciprocation of the rider 18 while improving controllability of the rider reciprocation.

Meanwhile, FIGS. 4, 5 and 6 respectively illustrate the rack gear application for the horizontal reciprocation of the rider 18. As shown therein, the guide member 26 employing the rack gear application includes a pair of side rack gears 40 parallel to each other and lengthwisely provided in the base frame 12, a roller gear 42 perpendicular to the side rack gears 40, and a roller gear motor 44 fixed to the rider to power the roller gear 42. The roller gear 42 is rollably connected to a rider 46 and rotatably mounted on the side rack gears 40.

To accelerate massaging effect, the massager **10** includes one or more pairs of roller coasters **50** parallel to each other. The roller coasters **50** are attached to the base frame **12** and above the rider guide rollers **52** formed on each side of the rider **18** (refer to FIG. 3). The rider guide rollers **52** are rollably engaged to the base frame **12** to guide a horizontally reciprocal movement of the rider **18**. That is, the roller coasters **50** are formed on each side of the base frame **12**. Here, the roller coasters **50** each have a substantially waved top surface **54**. It is preferred that the waved top surfaces **54** of the roller coasters **50** each substantially form a curvature of a human spinal cord.

In order to utilize the roller coasters **50**, there are provided two coaster guide rollers **90** formed outwardly extending from each side of the lifter **20**. The coaster guide rollers **90** enable the lifter **20** to make a roller coasting movement on and along the waved top surfaces **54** of the roller coasters **50**.

As shown in FIGS. 7-9, the lifter **20** has a top plate **120** and a bottom plate **122**, and a vertical actuator **400** that moves the top plate **120** up and down. The vertical actuator **400** includes a first link assembly **160**, and a lifter motor **128**. The top plate **120** has a top upper surface portion **130** and a top lower surface portion

132(refer to FIG. 8). The bottom plate **122** has a bottom upper surface portion **134** and a bottom lower surface portion **136**. The first link assembly **160** includes a gear shaft **162** rotatably attached to the bottom plate **122**, a link gear **164** fixed to the gear shaft **162**, a low link **166** fixed to the gear shaft **162**, a high link **168** connecting between the low link **166** and the top plate **120**. The lifter motor **128** rotates the link gear **164** either clockwise or counterclockwise direction, so that the rotation of the link gear **164** lifts or lowers the top plate **120** via the low link **166** and the high link **168**.

Four lifter guides **170** extend downward from the top lower surface portion **132** of the top plate **120** at the four corners of the top plate **120**. Four lifter guide bushes **172** extend upward from the bottom upper surface portion **134** of the bottom plate **122** to releasably receive the lifter guides **170**.

The lifter may further include a second link assembly **174** for balanced and more stabilized lifting and lowering operations. The second link assembly **174** includes a gear shaft **176** rotatably attached to the bottom plate **122**, a link gear **178** fixed to the gear shaft **176**, a low link **180** fixed to the gear shaft **176**, a high link **182** connecting between the low link **180** and the top plate **120**. The link gear **164** of the first link assembly

160 and the link gear 178 of the second link assembly 174 engage with each other so that when one rotates clockwise, the other rotates counterclockwise, and vice versa. The first link assembly 160 and the second link assembly 174 are positioned symmetrical with each other, as shown well in FIG. 8. Therefore, when the lifter motor 128 rotates the link gear 164 of the first link assembly 160, the first link assembly 160 and the second assembly 174 together lift or lower the top plate 120.

The link gears 164, 178 of the first and second link assemblies 160, 174 are spur gears having identical dimensions. The lifter motor 128 includes a driving spur gear 184 that engages with the link gear 164 of the first link assembly 160.

Referring back to FIG. 6, elongated guides 62 downwardly extend from the bottom lower surface portion 136 of the lifter 20, and guide bushes 64 are upwardly formed on the rider 18 to releasably receive the elongated guides 62 so as to stabilize the roller coasting movement of the lifter 20 along the roller coasters 50. Preferably, the elongated guides 62 are shaped in pins.

Two side coasting walls 156 extend downward from two opposing ends of the bottom plate 122, and the coaster

guide rollers **90** are rotatably attached to the side coasting walls **156**.

A massage plate **302**, on which the massage bumps **100** are installed, is provided. The air shock absorbers **300** are vertically installed between the massage plate **302** and the top plate **120**.

FIGS. 10 and 11 show the air shock absorber **300**. The air shock absorber **300** has a hollow cylinder **304**, a plunger **306** that is moved reciprocally in the cylinder **304**, a shaft **308** fixed to the plunger **306** and protruding out of the cylinder **304**, and a bracket **310**. The free end **312** of the shaft **308** is shaped as a ball, and the bracket has a semi-spherical recess **314** so that the end **312** of the shaft **308** and the recess **314** of the bracket form a ball and socket joint. The cylinder **304** is fixed to the top plate **120**, and the bracket **310** is fixed to the massage plate **302**. While the top plate **120** is parallel with the top panel **14**, the ball and socket joint enables arbitrary tilting of the massage plate **302** with respect to the top plate **120** as shown in FIGS. 9 and 10. In this way, the air shock absorbers **300** compensate the difference between the body contour of each of different users and the movement of massage bumps **100** performed by the rider **18** and the lifter **20**.

Pressurized air is provided into the cylinder **304** through a flow-in pipe **316** to lift the plunger **306** upward against the force applied by the massage bumps **100**. A flow-out pipe **318** is provided to make the space above the plunger **306** within the cylinder **304** to be communicated with outside.

The top plate **120** and the massage plate **302** are rectangular. Four air shock absorbers **300** are positioned near the four corners of the top plate **120**.

In order to finally apply the gear-operated link lifting mechanism to a patient lying on the massager **10**, there are provided the massage bumps **100** attached to the top upper surface portion **130** of the lifter **20** and moving vertically and/or horizontally along the elongated top opening **16** of the elongated top panel **14** of the base frame **12**. Optionally, a pad **17** may be provided to cover the massage bumps **100** and the elongated top opening **16** of the base frame **12**.

FIG. 9 shows that the top plate **120** is in its uppermost position, that is, the massage bumps **100** are in their topmost position. FIG. 8 shows that the top plate **120** is in its lowermost position, that is, the massage bumps **100** are in their lowermost position.

The massage bumps **100** are preferably partitioned to first and second pairs **102**, **104**(refer to FIG. 6). Here,

the first pair bumps **102** are aligned parallel to the second pair bumps **104**. The massage bumps **100** each include a heater **106** which can be a heating lamp generating heat and infrared rays (refer to FIG. 9).

To further improve massaging effect, there are provided first and second bump holders **108, 110** propping and maintaining the first and second pair bumps **102, 104** above the massage plate **302**. For a better massaging result, the first and second bump holders **108, 110** are tapered toward each lower end **109** thereof, and a first engagement member **112** to rockingly engage the lower ends **109** of the bump holders **108, 110** to the massage plate **302**, and a second engagement member **116** to rollingly engage the massage bumps **100** thereto, are provided. The massage bumps **100** may be roller balls formed of precious stone such as jade. In FIG. 6, fixed massage bumps **202** are provided between the massage bumps **100**.

FIG. 7 shows alternate massage bumps **98**. The massage bumps **98** are round projections that are fixed to the top upper surface portion **130** of the lifter **20**.

Although the invention has been described in considerable detail, other versions are possible by converting the aforementioned construction. Therefore, the scope of the invention shall not be limited by the specification specified above.